UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,647	12/21/2000	Peter William Cook	ROC920000163US1	9918

7590 04/19/2004

Robert R Williams
IBM Corporation Department 917
3605 Highway 52 North
Rochester, MN 55901-7829

EXAMINER	
HARKNESS, CHARLES A	

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 04/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/746,647	COOK ET AL.	
	Examiner	Art Unit	
	Charles A Harkness	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In response to the amendment to the title, the objection of the specification has been withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Janik et al, U.S. Patent Number 6,163,839 (herein referred to as Janik).

3. Referring to claims 1 and 8 Janik has taught a method for externally managing a data within an asynchronous pipeline (Janik column 1 lines 28-46 column 22 lines 22-26 column 24 lines 4-14), wherein said asynchronous pipeline includes a plurality of pipeline stages, and a data path and a control path traversing said plurality of pipeline stages in unison (Janik figure 1 references 12 and 14, the instruction pipe is the control path and the result pipe is the data path; the instructions and data values proceed through pipeline stages at the same time, or in unison – which by definition means at the same time, in opposite directions), said method comprising:

assigning a respective data tag value to each of a plurality of data sets, each said data set for input to said asynchronous pipeline in a respective input interval (Janik column 19 lines 4-10, column 2 lines 40-49);

sending each said respective data tag into said control path when said data set to which the respective data tag value is assigned is send into said data path such that said respective data

tag value passes through each successive stage of said plurality of stages of said asynchronous pipeline in unison with said data set to which the respective data tag value is assigned (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52); and

comparing each said data tag value with a respective control tag value associated with a given stage of said asynchronous pipeline (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52); and

in response to a data tag value matching a respective control tag value, permitting said matching data tag value and the data set to which said matching data tag value is assigned to pass in unison to a next stage within said asynchronous pipeline (column 13 lines 13-25, figures 1 and 3, column 19 lines 4-10; if they tags match between the instruction and the data, then they proceed on to the execution stage as shown in figures 1 and 3).

4. Referring to claims 2 and 9 Janik has taught wherein said step of assigning a respective data tag value comprises associating a respective encoded binary sequence with each said data set (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52; since the system is a digital computer, all of the values, including tags, would be represented in binary code, encoded to show which thread an instruction or value is apart of).

5. Referring to claims 3 and 10 Janik has taught wherein comparing step further comprises decoding said encoded binary sequences to identify said data tag values (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52; decoding the tag simply be taking the tag from the data value for matching to see if its apart of the same thread).

6. Referring to claims 4 and 11 Janik has taught further comprising delivering each said data tag value to a processor that is in communicative contact with said given stage (Janik column 2

lines 40-49, column 13 lines 13-25, column 19 lines 4-52, column 24 lines 24-39; the tag stay with the same processor with all the stages).

7. Referring to claims 5 and 12 Janik has taught further comprising:

Assigning a respective control tag value with respect to each said data tag value; and

Delivering said control tag values from said processor to said given stage (column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52, column 3 lines 36-54; the tag would have to be located when there is a matching taking place, which would be distributed throughout the pipeline when using the distributed ROB).

8. Referring to claims 6 and 13 Janik has taught wherein said given stage includes a logic function for processing said data, said method further comprising:

Determining whether or not each said respective control tag value matches each said data tag value; and

In response to determining that s control tag value matches s data tag value, delivering a control instruction from said processor to said logic function (column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52, column 3 lines 36-54).

9. Referring to claims 7 and 14 Janik has taught wherein said assigning step further comprises:

Receiving said data sets at the front-end of said asynchronous pipeline; and

Associating said data tag values with said data sets within a memory device (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52, column 3 lines 36-54; the tag and data value are stored in a register, which is known to be a memory; the tag is assigned as the value and instruction come into the ROB, which would be the beginning of the pipeline).

10. Referring to claim 15 Janik has taught an asynchronous pipeline apparatus for a digital data processing system (Janik column 1 lines 28-46 column 22 lines 22-26 column 24 lines 4-14), comprising:

Plurality of ordered stages traversed in parallel by a data path and a control path, and data path transmitting data sets through successive said ordered stages of said pipeline, each data set entering said pipeline in a respective input interval, said control path transmitting data tags through successive said ordered stages of said pipeline (Janik column 19 lines 4-10, column 2 lines 40-49), each data tag corresponding to a respective data set, each data tag being transmitted through each successive said ordered stage of said pipeline in unison with its corresponding data set (Janik figure 1 references 12 and 14, the instruction pipe is the control path and the result pipe is the data path; the instructions and data values proceed through pipeline stages at the same time, or in unison – which by definition means at the same time, in opposite directions); and

Stage advance control logic which controls the advancing of each said data set and its corresponding data tag through successive said ordered stages of said asynchronous pipeline, said stage advance control logic allowing each data set and its corresponding data tag to advance from a current stage to a successor stage upon satisfaction of a respective logical stage transitions (column 13 lines 13-25, figures 1 and 3, column 19 lines 4-10; if they tags match between the instruction and the data, then they proceed on to the execution stage as shown in figures 1 and 3), said logical stage transition condition includes the condition that the data tag at the current stage matches a control tag value associated with the stage transition (Janik column 2 lines 40-49, column 13 lines 13-25, column 19 lines 4-52).

Response to Arguments

11. Applicant's arguments filed 02/09/04, paper number 11, have been fully considered but they are not persuasive.

12. In the remarks, Applicant argues in essence that:

> "There is no suggestion that the tags which are used to identify the instruction producing data should be used for controlling the pipeline operation, i.e., the passage of data from one successive pipeline stage to the next..."

13. This is not found persuasive. Once the instructions and the data values are matched as they flow through their respective pipelines, (Column 13 lines 13-25, Janik column 19 lines 4-10) they will then pass on to the execution unit, which is another stage in the pipeline, together (figures 1 and 3).

14. In the remarks, Applicant argues in essence that:

> "Although Janik discloses asynchronous pipelines in its background, and suggests the use of asynchronous pipelines in the general sense, there is no specific disclosure of how the passage of data from one successive pipeline stage to the next would be asynchronously controlled."

15. This is not found persuasive. Janik when the instruction is matched the data values that it requires for execution, those values are then passed on to the execution stage (column 13 liens 13-25, figures 1 and 3).

16. In the remarks, Applicant argues in essence that:

> "...the data tags pass through the successive stages of the pipeline in unison with the data with which they are associated, i.e., a data tag is always in the same pipeline stage as the data with which it is associated;"

17. This is not found persuasive. The definition of the word "unison" means at the same time, not that two objects along "with each other" to the same stage. The data values and the tags of the instructions of Janik do move along in unison in their respective pipelines, in opposite directions.

18. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a data tag is always in the same pipeline stage as the data with which it is associated) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles A Harkness whose telephone number is 703-305-7579. The examiner can normally be reached on 8:00 A.M. – 5:30 P.M. with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 703-305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-7579.

Charles Allen Harkness

Patent Examiner

Art Unit 2183

April 15, 2004

EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100